1-86. (CANCELED)

87. (CURRENTLY AMENDED) A method of forming an implantable tissue construct for replacement of a human body part, the method comprising the steps of:

a) forming an inert material into a porous support structure having a predetermined shape and size corresponding to and substantially maintaining the predetermined shape and size of the human body part to be replaced;

b) encapsulating the entire porous support structure by ~~means of~~ a boundary layer of cell-impermeable material substantially conforming to the predetermined shape and size of the porous support structure;

c) introducing living cells into the porous support structure which constitutes a cell culture chamber;

d) promoting cell growth by introducing nutrients and oxygen to the living cells [[into]] in said porous support structure; and

e) after completion of cell growth, removing the boundary layer ~~after completion of the cell formation process~~; thereby producing the implantable tissue construct which corresponds to the predetermined shape and size of the human body part to be replaced; and

f) eliminating the porous support structure from the implantable tissue construct.

88. (CURRENTLY AMENDED) The method according to claim 87, further comprising the step of eliminating the porous support structure (1) ~~upon completion of forming the implantable tissue construct~~ by either mechanically removing, or biologically converting the support structure.

89. (PREVIOUSLY PRESENTED) The method according to claim 87, wherein the inert material used to form the porous support structure is phosphate.

90. (PREVIOUSLY PRESENTED) The method according to claim 87, wherein the cell-impermeable boundary layer (4) is a biological material or a synthetic material.

91. (PREVIOUSLY PRESENTED) The method according to claim 90, wherein the cell-impermeable boundary layer (4) is a hydrogel material.

92. (PREVIOUSLY PRESENTED) The method according to claim 87, wherein the cell-impermeable boundary layer material (4) is gas permeable.

93. (PREVIOUSLY PRESENTED) The method according to claim 87, further comprising the step of applying the boundary layer (4), which is impermeable to the cells, to the porous support structure by one of spraying and dipping in a bath (3).

94. (PREVIOUSLY PRESENTED) The method according to claim 87, further comprising the step of forming an intermediate layer, between the porous support

structure (1) and the boundary layer (4), from a material which remains unbound to the support structure (1) so that the intermediate layer facilitates removal of the boundary layer from the porous support structure.

95. (CURRENTLY AMENDED) The method according to claim 94, wherein the intermediate layer is a lipid layer ~~(elected species)~~.

96. (CURRENTLY AMENDED) A method of forming an implantable tissue construct for replacement for a human body part, the method comprising the steps of:

a) forming an inert material into a porous support structure having a shape and size corresponding to [[the]] a shape and size of the human body part to be replaced;

b) enclosing the entire porous support structure within a contiguous boundary layer of cell-impermeable material;

c) providing the porous support structure with at least one inlet;

d) introducing living cells into the porous structure;

e) promoting cell growth within the porous ~~suport~~ support structure, by introducing nutrients and oxygen to the living cells, so that the cells conform to the size and shape of the porous support structure; and

f) removing the boundary layer; thereby producing an implantable tissue construct which corresponds to the shape and size of the human body part to be replaced.

97. (CANCELED)

98. (CURRENTLY AMENDED) ~~The method according to claim 87, further comprising the step of~~ A method of forming an implantable tissue construct for replacement of a human body part, the method comprising the steps of:

a) forming an inert material into a porous support structure having a predetermined shape and size corresponding to and substantially maintaining the predetermined shape and size of the human body part to be replaced;

b) encapsulating the entire porous support structure by a boundary layer of cell-impermeable material substantially conforming to the predetermined shape and size of the porous support structure;

c) introducing living cells into the porous support structure which constitutes a cell culture chamber;

d) promoting cell growth by introducing nutrients and oxygen to the living cells in said porous support structure;

e) after completion of cell growth, removing the boundary layer thereby producing the implantable tissue construct which corresponds to the predetermined shape and size of the human body part to be replaced; and

f) removing the boundary layer (4) from the implantable tissue construct by one of:

mechanically detaching the boundary layer from the porous support structure, and

solubilizing the porous support structure.

99. (CURRENTLY AMENDED) ~~The method according to claim 87, further comprising the step of~~ A method of forming an implantable tissue construct for replacement of a human body part, the method comprising the steps of:

a) forming an inert material into a porous support structure having a predetermined shape and size corresponding to and substantially maintaining the predetermined shape and size of the human body part to be replaced;

b) encapsulating the entire porous support structure by a boundary layer of cell-impermeable material substantially conforming to the predetermined shape and size of the porous support structure;

c) introducing living cells into the porous support structure which constitutes a cell culture chamber;

d) promoting cell growth by introducing nutrients and oxygen to the living cells in said porous support structure and introducing a plurality of the porous support structures (1) into a nutrient solution to facilitate cell growth prior to removal of the boundary layer; and

e) after completion of cell growth, removing the boundary layer thereby producing the implantable tissue construct which corresponds to the predetermined shape and size of the human body part to be replaced.

100. (WITHDRAWN) The method according to claim 90, further comprising the steps of forming the boundary layer (4) from an alginate which is polymerized in a calcium chloride solution and, after formation of the cell layer, removing the boundary layer (4) from the porous support structure (1) by dissolving the porous support structure (1) with a low-calcium solution.

101. (WITHDRAWN) The method according to claim 90, further comprising the step of forming the boundary layer (4) from an overgrowth of cells which forms a membrane.

102. (WITHDRAWN) The method according to claim 90, further comprising the step of forming the boundary layer (4) from one of cartilage cells, fibroblasts, osteoblasts and chondrocytes.

103. (WITHDRAWN) The method according to claim 87, further comprising the step of pressuring the porous support structure (1) via one of a liquid and a gaseous medium.

104. (WITHDRAWN) The method according to claim 103, further comprising the step of inserting the support structure (1) into a container (14) containing one of the liquid medium and the gaseous medium so as to pressurize the porous support structure (1).

105. (WITHDRAWN) The method according to claim 103, further comprising the steps of placing a protective film (20) around the support structure (1) to form a pressure chamber around the support structure (1), and pressurizing an exterior of the protective film (20).

106. (WITHDRAWN) The method according to claim 87, further comprising the steps of incorporating the porous support structure (1) into a nutrient circuit (11) and connecting the porous support structure (1) to an oxygen source.

107. (WITHDRAWN) The method according to claim 106, further comprising the step of connecting the porous support structure (1) to a nutrient reservoir (13) communicating with the nutrient circuit (11).

108 - 112 (CANCEL)

113. (PREVIOUSLY PRESENTED) The method according to claim 96, further comprising the step of eliminating the porous support structure (1) upon completion of forming the implantable tissue construct by either mechanically removing, or biologically converting the support structure.

114. (PREVIOUSLY PRESENTED) The method according to claim 96, wherein the inert material used to form the porous support structure is phosphate.

115. (PREVIOUSLY PRESENTED) The method according to claim 96, wherein the cell-impermeable boundary layer (4) is a biological material or a synthetic material.

116. (PREVIOUSLY PRESENTED) The method according to claim 115, wherein the cell-impermeable boundary layer (4) is a hydrogel material.

117. (PREVIOUSLY PRESENTED) The method according to claim 96, wherein the cell-impermeable boundary layer material (4) is gas permeable.

118. (PREVIOUSLY PRESENTED) The method according to claim 96, further comprising the step of applying the boundary layer (4), which is impermeable to the cells, to the porous support structure by one of spraying and dipping in a bath (3).

119. (PREVIOUSLY PRESENTED) The method according to claim 96, further comprising the step of forming an intermediate layer, between the porous support structure (1) and the boundary layer (4), from a material which remains unbound to the support structure (1) so that the intermediate layer facilitates removal of the boundary layer from the porous support structure.

120. (CURRENTLY AMENDED) The method according to claim 119, wherein the intermediate layer is a lipid layer ~~(elected species)~~.

121. (PREVIOUSLY PRESENTED) The method according to claim 96, further comprising the step of eliminating the porous support structure from the implantable tissue construct.

122. (PREVIOUSLY PRESENTED) The method according to claim 96, further comprising the step of removing the boundary layer (4) from the implantable tissue construct by one of:

mechanically detaching the boundary layer from the porous support structure, and

solubilizing the porous support structure.

123. (PREVIOUSLY PRESENTED) The method according to claim 96, further comprising the step of introducing a plurality of the porous support structures (1) into a nutrient solution to facilitate cell growth prior to removal of the boundary layer.